CLAIMS:

1. An improved vehicle wheel service system having a central processing unit and configured to support a vehicle wheel assembly consisting of at least a vehicle wheel rim on a rotating support structure, the improvement comprising:

an imaging sensor assembly disposed to acquire one or more optical images of at least a portion of the vehicle wheel assembly, said imaging sensor further configured to acquire distance information associated with each of said one or more acquired optical images; and

wherein the central processing unit is configured to receive at least said distance information from said imaging sensor assembly to facilitate one or more vehicle wheel service procedures.

2. The improved vehicle wheel service system of Claim 1 wherein the vehicle wheel service system is a vehicle wheel balancing system.

3. The improved vehicle wheel service system of Claim 1 wherein the vehicle wheel service system is a vehicle tire changing system.

4. The improved vehicle wheel service system of Claim 1 wherein said distance information is representative of a distance between said imaging sensor assembly and said portion of the vehicle wheel assembly.

5. The improved vehicle wheel service system of Claim 1 wherein each of said one or more optical images consists of a two dimensional array of pixel elements, and wherein said imaging sensor is configured to acquire distance information for each pixel element in said two dimensional array of pixel elements.

6. The improved vehicle wheel service system of Claim 1 wherein said imaging sensor is further configured to acquire distance information associated with each of said one or more acquired optical images for at least one feature contained within said one or more acquired optical images.

7. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify a surface profile of the vehicle wheel rim.

8. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to calculate one or more parameters of the vehicle wheel assembly.

9. The improved vehicle wheel service system of Claim 8 wherein said one or more parameters is radial runout of one or more tire bead seat surfaces of the vehicle wheel rim.

10. The improved vehicle wheel service system of Claim 8 wherein said one or more parameters is lateral runout of the vehicle wheel rim.

11. The improved vehicle wheel service system of Claim 8 wherein the central processing unit is configured to store said one or more calculated parameters for subsequent retrieval.

12. The improved vehicle wheel service system of Claim 11 wherein the central processing unit is configured to store said one or more calculated parameters in a data storage means associated with the vehicle wheel assembly for subsequent retrieval.

13. The improved vehicle wheel service system of Claim 8 wherein the central processing unit is configured to communicate said one or more calculated parameters to a second vehicle wheel service system.

14. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify a miss-centering of the vehicle wheel rim on the rotating support structure.

15. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify the presence of an installed tire pressure sensor associated with the vehicle wheel assembly.

16. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify one or more features of the vehicle wheel assembly.

17. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a spoke configuration.

18. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a spoke profile.

19. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a wheel rim edge profile.

20. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a valve stem location.

21. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a tire defect.

22. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a tire tread depth.

23. The improved vehicle wheel service system of Claim 16 wherein said one or more features include an installed imbalance correction weight.

24. The improved vehicle wheel service system of Claim 16 wherein said one or more features include a wheel rim surface defect.

25. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to identify one or more imbalance correction weight placement locations on the vehicle wheel rim.

26. The improved vehicle wheel service system of Claim 1 further including at least one tire bead removal arm supporting a tire bead roller for operatively engaging the vehicle wheel assembly to displace a tire from the wheel rim, and wherein said imaging sensor assembly is disposed on said at least one tire bead removal arm.

27. The improved vehicle wheel service system of Claim 25 wherein said imaging sensor assembly is disposed on said at least one tire bead removal arm adjacent said tire bead roller, and wherein said imaging sensor assembly has a field of view including a portion of a vehicle wheel rim tire bead seat exposed during operative engagement between said tire bead roller and the vehicle wheel assembly.

28. The improved vehicle service system of Claim 1 wherein said imaging sensor assembly is configured for movement to alter a field of view associated with said imaging sensor assembly.

29. The improved vehicle service system of Claim 1 wherein said imaging sensor assembly is remotely disposed from the rotating support structure.

30. The improved vehicle wheel service system of Claim 1 wherein the central processing unit is further configured to utilize said distance information to alter a configuration of one or more components of the improved vehicle wheel service system.

31. The improved vehicle wheel service system of Claim 30 further including an adjustable tire inflation means, and wherein said central processor is further configured to utilize said distance information to position said tire inflation in operative proximity to the vehicle wheel assembly to assist in mounting and inflating a tire on the vehicle wheel rim.

32. The improved vehicle service system of Claim 30 further including a pair of tire bead removal arms each supporting a tire bead roller for operatively engaging the vehicle wheel assembly to displace a tire from the wheel rim, and wherein said central processor is further configured to utilize said distance information to position each of said tire bead removal arms such that said associated tire bead rollers operatively engage the vehicle wheel assembly.

33. The improved vehicle wheel service system of Claim 32 wherein the central processing unit is further configured to alter an engagement of said tire bead rollers with said vehicle wheel assembly responsive to said distance information indicative of the presence of a wheel assembly feature.

34. The improved vehicle wheel service system of 33 wherein said wheel assembly feature is a valve stem.

35. The improved vehicle wheel service system of 33 wherein said wheel assembly feature is an installed tire pressure sensor.

36. An improved wheel parameter measurement apparatus for a dynamic wheel balancer having a spindle shaft for mounting a vehicle wheel assembly consisting of at least a vehicle wheel rim for rotation thereon, the improvement comprising:

an optical energy means where at least a partial amount of said optical energy impinges an area of the wheel assembly on the spindle,

an optical energy sensing means for providing signals containing three dimensional data responsive thereto, and

a means receiving said signals provided by said optical energy sensing means for extracting data relating to at least one of said features of the mounted wheel assembly,

37. The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature location on the mounted wheel assembly.

38. The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a feature dimension on the mounted wheel assembly.

39. The improved wheel parameter measurement apparatus of claim 36 wherein said extracted data identifies a configuration of said at least one feature on the mounted wheel assembly.

40. An improved vehicle wheel tire changer system support for rotationally mounting a vehicle wheel assembly consisting of at least a vehicle wheel rim for rotation thereon, the improvement comprising:

an optical energy means where at least a partial amount of said optical energy impinges an area of the wheel assembly on the support,

an optical energy sensing means for providing signals containing three dimensional data responsive thereto, and

a means receiving said signals provided by said optical energy sensing means for extracting data relating to at least one of said feature of the mounted wheel assembly,

41. The improved wheel parameter measurement apparatus of claim 40 wherein said extracted data identifies a feature location on the mounted wheel assembly.

42. The improved wheel parameter measurement apparatus of claim 40 wherein said extracted data identifies a feature dimension on the mounted wheel assembly.

43. The improved wheel parameter measurement apparatus of claim 40 wherein said extracted data identifies a feature configuration on the mounted wheel assembly.

44. A method for measuring one or more features of a vehicle wheel assembly consisting of at least a vehicle wheel rim where the vehicle wheel assembly is mounted for rotational movement about an axis on a vehicle wheel service system comprising the steps of:

providing optical energy means where at least a partial amount of said optical energy impinges an area of the vehicle wheel assembly,

detecting said optical energy reflected from said impinged area of the vehicle wheel assembly;

generating a two-dimensional image of said detected optical energy, said two-dimensional image composed of a plurality of image pixels and encoding three-dimensional data;

processing said detected optical energy to extract dimensional data associated with said one or more features of the vehicle wheel assembly.

45. A method for selecting imbalance correction weight parameters in a vehicle wheel balancing system including an imaging sensor assembly configured to provide dimensional data associated with features in a field of view encompassing at least a portion of a vehicle wheel assembly undergoing a vehicle wheel balancing procedure, comprising:

providing, within the field of view of the imaging sensor assembly, an indicator at an location on a vehicle wheel rim of the vehicle wheel assembly at which at least one imbalance correction weight is to be placed;

acquiring at least one image of said indicator with said imaging sensor assembly;

identifying said location on said vehicle wheel rim from said position of said indicator within said at least one image;

calculating one or more imbalance correction weight parameters corresponding to at least one imbalance correction weight disposed in an imbalance weight correction plane at said identified location.

46. A method for selecting imbalance correction weight parameters in a vehicle wheel balancing system including an imaging sensor assembly configured to

provide dimensional data associated with features in a field of view encompassing at least a portion of a vehicle wheel assembly undergoing a vehicle wheel balancing procedure, comprising:

providing, within the field of view of the imaging sensor assembly, an indicator at an location on a vehicle wheel rim of the vehicle wheel assembly at which at least one imbalance correction weight is to be placed;

acquiring at least one image of said indicator with said imaging sensor assembly;

providing a representation of said indicator relative to at least one imbalance correction weight placement location.